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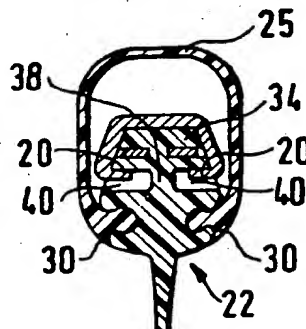
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(54) **Wiper blade assembly**

(57) A wiper blade assembly comprises a wiper strip 22, a harness supporting said strip, and a cover member 25 covering the harness and detachably connected at its edges to the wiper strip.

FIG. 2



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FIG. 1

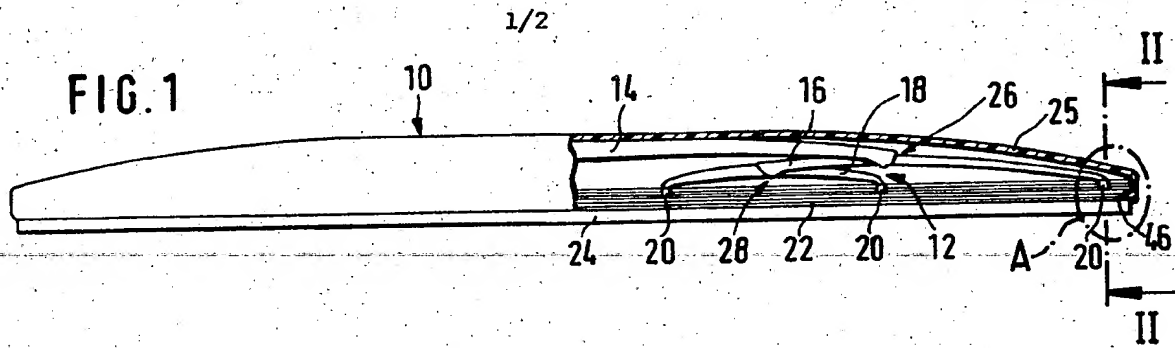


FIG. 2

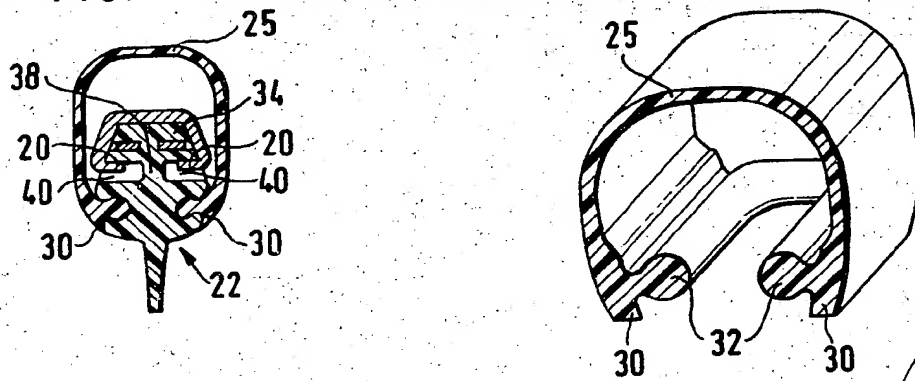
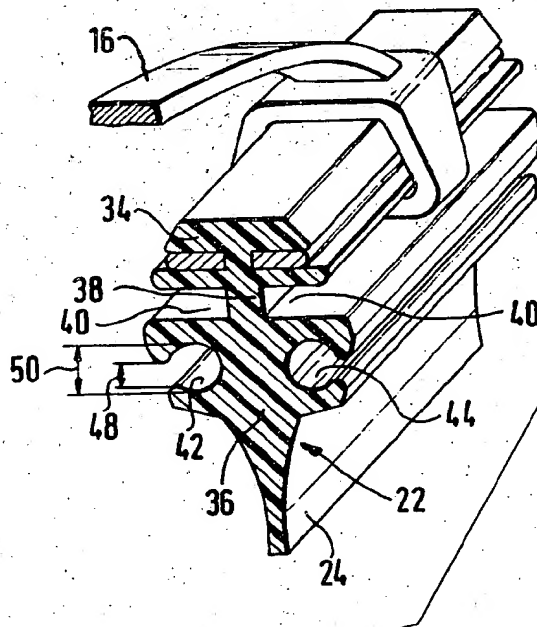


FIG. 3



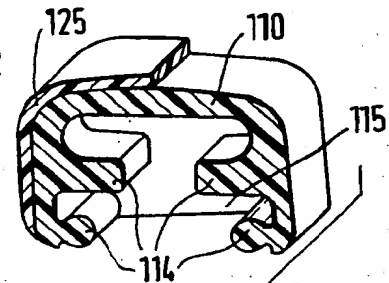
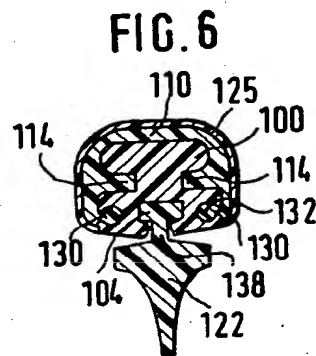
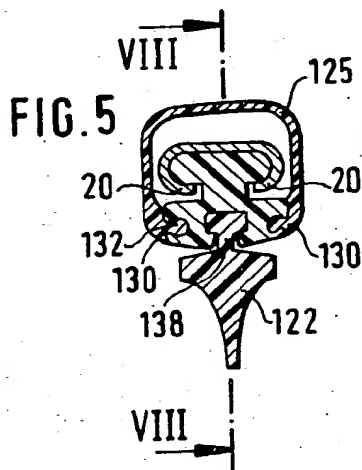
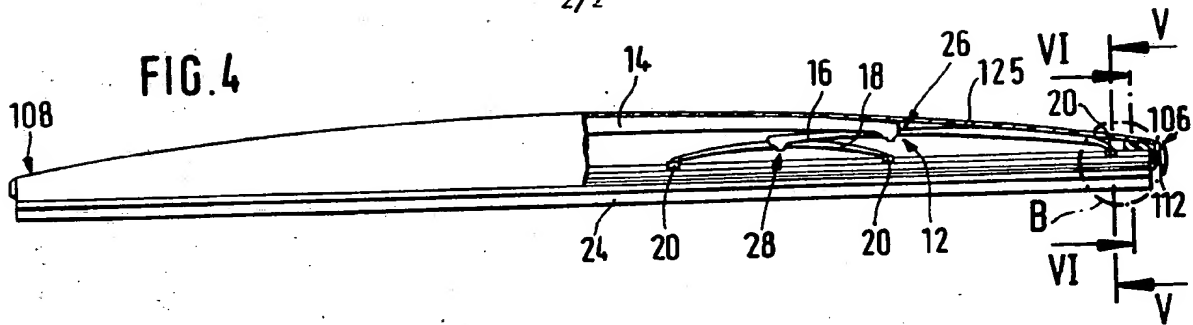
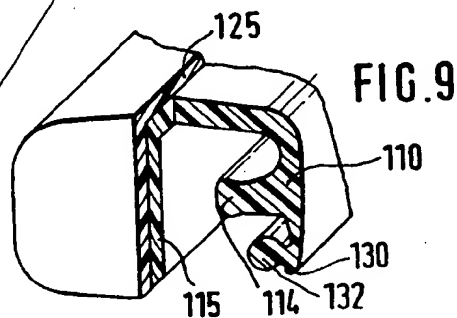
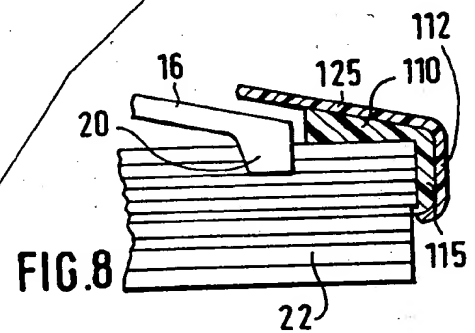
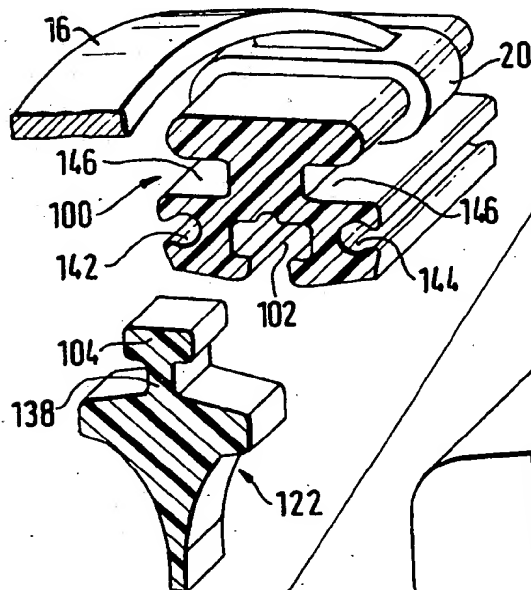


FIG. 7



SPECIFICATION

Wiper blade assembly

- 5 The present invention relates to a wiper blade assembly, especially for a motor vehicle.

In a known wiper device, a pocket rim is so assembled that a hose-like enveloping of the wiper blade results. In order for a pane to be

- 10 cleaned, a wiper lip is formed on this hose sleeve at its side facing the pane and a wiper lip receiving groove, matched in cross-section to the lip cross-section, is present in the sleeve for protection of the wiper lip of the
- 15 wiper strip. A wiper device thus constructed is relatively complicated and therefore expensive. In addition, the wiping quality is unsatisfactory.

- 20 According to the present invention there is provided a wiper blade assembly comprising a blade element which comprises a wiper strip, a plurality of members pivotably interconnected to form a carrier carrying the blade element, and a cover member arranged over
- 25 the carrier to cover at least the regions of pivotable interconnection of the carrier members and detachably connected in an edge region thereof to the part of the blade element held by the carrier.

- 30 A wiper blade assembly embodying the present invention may have the advantage that the wiper lip of the wiper strip projects out of the cover member and rests on the pane, whilst the pivot points of the carrier members lie in the cover member, the rim of which is closely connected with the wiper blade part. The wiping quality is unchanged compared with a wiper blade without a sleeve or cover member, because the original wiper
- 40 lip remains in function.

Embodiments of the present invention will now be more particularly described by way of example with reference to the accompanying drawings, in which:

- 45 *Figure 1* is a partly sectioned elevation of a first wiper blade assembly embodying the invention;

Figure 2 is a cross-section, to an enlarged scale, of the assembly along the line II-II of

- 50 *Fig. 1*;
- Figure 3* is an isometric exploded view, to an enlarged scale, of the end portion A of the assembly of *Fig. 1*;

- 55 *Figure 4* is a partly sectioned elevation of a second wiper blade assembly embodying the invention;

Figure 5 is a cross-section, to an enlarged scale, along the line V-V of *Fig. 4*;

- 60 *Figure 6* is a cross-section, to an enlarged scale, along the line VI-VI of *Fig. 4*;

Figure 7 is an isometric exploded view, to an enlarged scale, of the end portion at "B" of the wiper blade assembly of *Fig. 4*;

- 65 *Figure 8* is a sectional elevation of the end portion along the line VIII-VIII of *Fig. 5*; and

Figure 9 is a partly sectioned isometric view of the end portion of the assembly.

Referring now to the drawings, there is shown in *Fig. 1* a wiper blade assembly having a carrier bracket frame 12, which is constructed from several frame parts 14, 16 and 18 articulately connected together and each shaped in the manner of a bow. The frame parts 16 and 18 have retaining claws 20 which hold a wiper strip 22 having a wiper lip 24 which can rest on a pane (not shown) to be cleaned. In operation, the resulting elongate wiper blade 10 is displaced transversely to its longitudinal extent on the pane. The frame 12 is surrounded by a pocket-like sleeve 25 consisting of a rubber-elastic material so that the hinge regions 26 and 28 of the frame 12 are covered.

- In order that the sleeve 25 can be detachably connected with the wiper blade it is provided near its opening or pocket rim 30 with a bead 32 (*Figs. 2 and 3*), which runs along the rim 30 and is integrally connected with the sleeve 25. As is apparent from *Fig. 3*, the wiper strip 22 essentially consists of a head or retaining strip portion 34, which is encompassed by the claws 20, and a wiper body 36 with the wiper lip 24. The wiper body 36 is connected through a tilt web 38 with the strip portion 34. The web 38 is formed by two longitudinal grooves 40, which are disposed opposite each other and into which the claws of the frame parts 14, 16 and 18 engage, the grooves 40 being arranged between the wiper body 36 and the strip portion 34. Two longitudinal grooves 42 and 44, which are interconnected by transverse grooves 46 (*Fig. 1*), are disposed opposite each other in the body 36. The grooves 42, 44 and 46 thus extend around the body 36 of the wiper strip 22. The cross-section of the groove extending all round is matched to the cross-section of the bead 32 on the sleeve 25. In that case, the bead 32 is so undercut that it can be buttoned securely into the grooves 42, 44 and 46, so that unintentional detaching of the rim 30 from the wiper body 36 is avoided. The grooves 42, 44 and 46 thus have an opening 48 which is smaller than the greatest groove width 50. When the sleeve 25 is connected with the wiper blade 10, the arrangement illustrated in *Fig. 2* results. It is in that case important that the web 38 of the wiper strip 22 is enclosed by the sleeve 25 so that filling of the grooves 40 with snow and/or ice is not possible. The operational reliability of the wiper blade assembly is thus maintained in the case of strong snowfall or sleet.

- 125 In the embodiment according to *Figs. 4 to 9*, the claws 20 of the frame 12 engage at a rail 100 produced of a resilient synthetic, for example plastics, material (*Figs. 5 to 7*) and the rail itself is provided with a longitudinal receiving groove 102 in which the wiper strip
- 130

122 is retained by a retaining strip 104. In this embodiment, the tilt web 138 of the wiper strip 122 is arranged between the retaining strip 104 and the rest of the wiper strip 122. Longitudinal grooves 142 and 144, the cross-section of which substantially corresponds to the cross-section of the longitudinal grooves 42 and 44 in the embodiment according to the Figs. 1 to 3, are arranged in the mutually opposite longitudinal sides of the rail 100. In order to secure the rail 100 and thereby the wiper strip 122 against longitudinal displacement in the frame 12, a respective filler element 110 is disposed at each of the end regions 106 and 108 of the rail 100. The end portions 112 of the sleeve 125 are firmly glued to the filler element 110. In order to prevent the filler elements from being pushed too far onto the rail 100, each element 110 has an end limb 115, which acts as an abutment and co-operates with a respective one of the end surfaces of the rail 100. In order to ensure good guidance between the elements 110 and the rail 100, the elements 110 have projections 114 engaged in the longitudinal grooves 146 and also projections 132 engaged in the longitudinal grooves 142 and 144. The grooves 146 also serve for reception of the claws 20. In this embodiment, too, beads 132, which are arranged near the rim 130 of the sleeve 125, are detentable within the grooves 142 and 144 in the rail 100, the grooves 142 and 144 and the beads 132 being matched in cross-section in correspondence with the beads 32 and the grooves 42 and 44 in the abovedescribed embodiment of Figs. 1 to 3. A secure detenting of the beads 132 in the grooves 142 and 144 is achieved by integral connection of the beads with the sleeve 125 so that the sleeve and thus the beads consist of an elastic, rubber-like material.

It is common to both embodiment that the sleeve 25 or 125 is detachably fastened by its pocket rim 30 or 130 at the wiper blade part (wiper strip 22 or resilient rail 100) retained by the carrier bracket frame 12.

In a modification of the described embodiments, the detent groove is arranged on the sleeve and the wiper blade part, held by the carrier frame, is provided with the detent beads. It is essential that the one detent element is arranged at the wiper blade part carried by the carrier frame and the counter-detent element, co-operating therewith, is arranged in the region of the sleeve rim.

CLAIMS

1. A wiper blade assembly comprising a blade element which comprises a wiper strip, a plurality of members pivotably interconnected to form a carrier carrying the blade element, and a cover member arranged over the carrier to cover at least the regions of pivotable interconnection of the carrier mem-

bers and detachably connected in an edge region thereof to the part of the blade element held by the carrier.

2. An assembly as claimed in claim 1, wherein said blade element part is provided with first detent means at each of two mutually opposite sides thereof and the cover member is provided with second detent means complementary to and in detent engagement with the first detent means.

3. An assembly as claimed in claim 2, the first detent means being provided by a groove having an entry narrower than the greatest width of the groove.

4. An assembly as claimed in claim 3, the detent means comprising a bead substantially corresponding in cross-section to that of the groove.

5. An assembly as claimed in either claim 3 or claim 4, the first detent means being arranged at the wiper strip.

6. An assembly as claimed in claim 5, the groove being provided in the wiper strip.

7. An assembly as claimed in claim 6, wherein the groove and the bead are arranged to extend around said edge region of the cover member.

8. An assembly as claimed in claim 7, wherein the wiper strip comprises a head portion held by the carrier members and a body portion which is connected to the head portion by a web and which is provided with a wiper edge, the cover member being arranged to cover the head portion and the web and being detachably connected to the body portion.

9. An assembly as claimed in either claim 3 or claim 4, wherein the blade element further comprises a resilient rail member, which is held by the carrier members and which holds the wiper strip, the first detent means being arranged at two opposite longitudinal sides of the rail member.

10. An assembly as claimed in claim 9, wherein the rail member is provided at at least one end portion thereof with a filler element secured to a respectively associated end portion of the cover member.

11. An assembly as claimed in claim 10, wherein the or each filler element is provided with mutually facing projections engaged in respective length portions of the groove.

12. A wiper blade assembly substantially as hereinbefore described with reference to Figs. 1 to 3 of the accompanying drawings.

13. A wiper blade assembly substantially as hereinbefore described with reference to Figs. 4 to 9 of the accompanying drawings.

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